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ABSTRACT

Learning activities, teaching materials, and lesson plans are contained in this guide, developed by six teachers at the Carl Sandburg Middle School in Freeport, Illinois; it suggests ways to integrate environmental study into the existing curriculum for art, science, English, mathematics, and social studies. Activities for classroom learning and school site exploration are organized by subject area, with the science, mathematics and social studies sections including lists of environmental concepts currently taught. The art section provides a list of supplies, scrap materials and tools, and suggests over 50 projects in a variety of media, including drawing, painting, sculpture, and collage. The science section includes materials for teaching 48 environmental study vocabulary words and suggestions for using the school site and neighborhood to learn about weathering and erosion and plant and animal identification. Mathematics activities include calculating costs of various types of pollution, checking home energy usage; and estimating heights of trees and buildings. Suggestions for book reports, creative writing, and vocabulary skills are covered in the English section. The social studies section provides student worksheets for exploration and observation of the school site. A list of films, filmstrips, and books available for the Sandburg Environmental Education program is appended. (JH)

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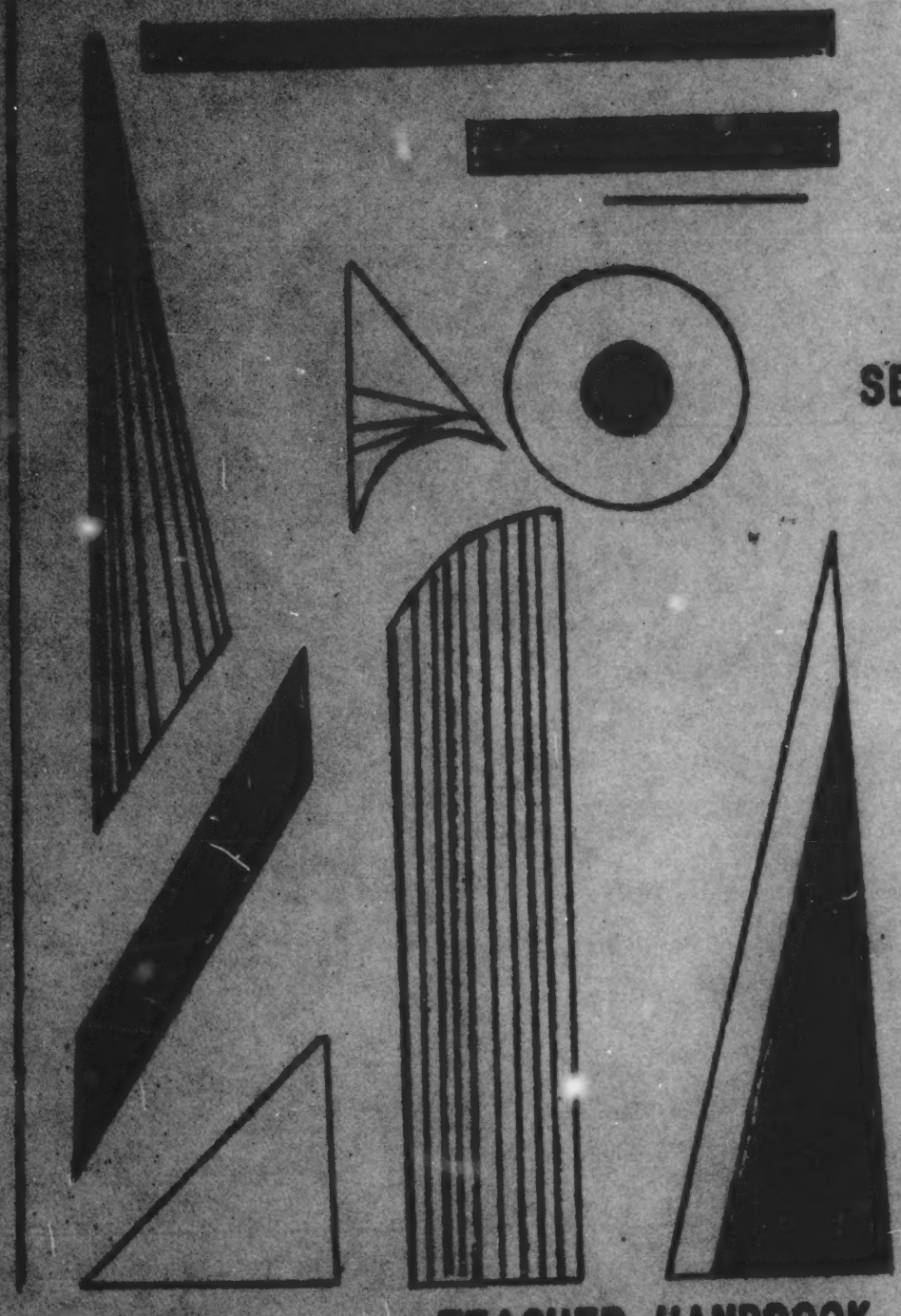

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TEACHER HANDBOOK

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FREEPORT SCHOOL DISTRICT 145
RC011554

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TEACHER'S GUIDE

to

SANDBURG ENVIRONMENTAL EDUCATION

produced by

ENVIRONMENTAL EDUCATION COMMITTEE

of

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in

cooperation with

UPPER MISSISSIPPI ECO-CENTER

for

DISTRICT 145 FREEPORT, ILLINOIS

[1976]

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PREFACE

"No man can reveal to you aught but that which already lies half asleep in the dawning of your knowledge.

"The teacher who walks in the shadow of the temple, among his followers, gives not of his wisdom but rather of his faith and his lovingness.

"If he is indeed wise he does not bid you enter the house of his wisdom, but rather leads you to the threshold of your own mind."

excerpt from the poem On Teaching in The Prophet, by Kahlil Gibran

Although a large number of people may believe the learning process to be a fairly simple process akin to pouring water into a bottle, real teachers know otherwise. The real teacher knows that true and meaningful learning comes only from involvement.

A few months ago a team of six teachers at Carl Sandburg Middle School chose to participate in a project which required them to dig deeply into their own resevoir of experiences. This project required them to exchange and explore ideas in a very confined setting. Sometimes they expressed ideas that were immediately "shot down" by other members of the group. But they kept trying. They shared, they invented, they explored and they worked. They compromised original thoughts and developed better ones.

This book is the result of many, many hours of their working together as a team, a team which developed this fine curriculum entitled Sandburg Environmental Education. It was written by real teachers.

ACKNOWLEDGMENTS

The following participated in making this Curriculum Guide possible:

Carl Sandburg teachers -

Madelyn Bennett. . . . Language Arts
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Student Handbook under separate cover

PHILOSOPHY

Each generation inherits planet earth as it was left by the last generation. The life support systems of land, air, and water are limited. Students must be aware of the functions, limits, and controls of the environment in order for all species to survive. When a species or non-renewable resource is depleted on the fragile capsule, earth, it will never occur again. Concern for the proper maintenance of our renewable resources must be developed; thus the instruction of environmental education is essential.

District Goals or Objectives

The major objective is the implementation and the coordination of a comprehensive environmental education program for the community of Freeport.

1. This objective is carried out through the Sandburg SEE program.

2. The development of an inservice program for District 145 teachers.

3. The implementation of applicable portions of the state's environmental program.

Sandburg Environmental Education Program Objectives

1. The SEE program is not a separate entity but a part of the total education of the student, and should be implemented in the existing curriculum of the subject areas.

2. The SEE program should be a practical skills program that will assist students in the present and the future to enjoy, conserve, and appreciate their environment.

3. To develop these environment skills, the student will become involved in classroom inquiry, school site activities, field trips, and community resources.

Teacher Objectives

In implementing environmental education into the Sandburg curriculum, the following objectives should be considered:

1. To assist the student in gaining knowledge and understanding about conserving the environment.

2. To assist the students to properly utilize their environment for appreciation and recreation.

3. To assist the students in developing skills necessary for conserving the environment.

Student Objectives

. The student should be able to identify the environmental concepts and problems basic to the SEE program.

2. The students should learn proper utilization of the environment for appreciation and recreation through positive aesthetic experiences and leisure time activities.

3. The students should develop the following skills for conserving the environment: gathering information, critical thinking, organization of data, discussion.

INTRODUCTION

The survival of any species is directly related to the environment. Man needs to understand the principles of the environment to live a full and healthy life. This deems that education should get into the business of making each citizen aware and concerned with the world and its environmental situations.

The use of all educational techniques should be mobilized to insure the proper instruction for positive environmental education. Classroom discussion, reading, audio-visual materials and resource people aid in the emphasis of environmental education.

The school site, with selected learning activities, helps make the student realize that environmental education must occur in the real world. Field trips to natural and man-created areas give depth to seeing the environment through first hand experiences. Students must see that man cannot divorce himself from the natural world and continue a normal life. Using the classroom, school site, and field trips, a balanced environmental education program may be developed with meaning for the student.

This guide is merely a guide and does not limit the teacher to the scope of this printing. Teachers should feel free to add, change, or delete activities to provide the student with a comprehensive experience that will be suitable for successful living. Teachers need training in environmental education and hopefully, this guide will open the door for future in-service programs, workshops, and college courses.

The activities in the guide are divided into subject areas so that each department will realize its responsibility to the program. It also provides for departments to revise and improve the program as they see their position in the total program change.

The guide was written and compiled by teachers in hopes that the materials will be used by other teachers for instruction in environmental education. Additions, modifications, and deletions are welcomed by the writers. If it is desirable to use the activity, it is permissable to reproduce as many copies as needed. It is assumed that this first step will open avenues to a complete, comprehensive, and understandable environmental education program for the community of Freeport.

THE MAY EVALUATION OF SEE PROGRAM

Six teachers were selected to have an inservice in order to improve the environmental education of District 145. The inservice was planned that we would have environmental awareness.

It was decided that Environmental Education would be integrated into the existing curriculum. This will make the program extend throughout the year with all 25 teachers participating.

Each member surveyed the present curriculum and made a list of all environmental material in the existing program. After this survey, the committee felt the need to add and try some experiences before planning the program for 1976-77 school year. It was decided that the year would start with an Environment Awareness Week to include student and teachers. Activities were planned for classroom, school site, and a field trip.

Two classroom activities in science dealt with vocabulary. Both activities gave 24 words and definitions with a picture and a question. The object was to teacher the terminology used with environmental education.

School site activities included a study of erosion, senses in nature and creative writing.

In a vacant grassy, tree-lined lot right across from Sandburg, the Freeport City council voted to build a fire station. It sparked much discussion from the immediate residents and proved to be an issue that interested many students. The Language Arts creative writing classes walked to the construction site, remembered what had been there, what was there now, and wrote their feelings about the location for this fire station. About 10% of the papers received were in favor of the fire station, 40% were opposed to it being built at that site, and 50% saw good and bad points about it. Both teacher and students felt that it was a very successful project.

The SEE program (Sandburg Environmental Education) was launched with the writing of a student handbook for a half day field trip to three local parks. There was a positive awareness for both students and teachers to the local environment. It was a half day worth all the organization on the part of the teachers.

The committee is constructing a teacher's guide so that the SEE program can be fully implemented for 1976-77 school year. The year will start with an Environmental Awareness Week for students and teachers. Throughout the year, class activities, school site activities, and audio-visuals about environmental education will be added in each discipline area. A pre-test and post-test will be given to measure student change. The year hopefully will be climaxed with a field trip for all students.

ART

VISUAL ARTS SPECIFICALLY SEEK TO INVOLVE THE STUDENT IN PERCEIVING THE WORLD HE LIVES IN, REACTING TO THE THINGS HE SEES AND FEELS, AND INTERPRETING HIS EMOTIONS, FEELINGS, AND INSIGHTS THROUGH A VARIETY OF VISUAL MATERIALS.

USEFUL SUPPLIES AND SCRAP MATERIALS

When considering materials and supplies that can be used in the art program, one generally thinks first in terms of those commercially and specifically made for the art class. It is often possible that exciting materials can be found that are not commonly thought of as art supplies but can be used in the art program. These materials are not new, for many have seen the possibilities in these materials for years. The materials listed here will be those that can be secured with little or no expense.

Even as there are hundreds of materials, so there are hundreds of ways of using and combining them into projects. This is only a brief list, but as one reads this list many others should come to mind.

sandpaper	rubber tubing	fish scales	sponges
wallpaper	adhesive tape	sea shells	screen
paper toweling	confetti	pebbles	linoleum
wrapping papers	beads	nuts	light woods
colored papers	buttons	dried flowers	plastics
tissue papers	buckles	coins	pins
crepe paper	erasers	pieces of metal	hair pins
cellophane	chicken rings	pods	hat pins
blotters	old jewelry	dried weeds	fish hooks
tinfoil	dried corn	piano keys	matches
cardboard	beans	tiny bottles	straws
waxed paper	sequins	shot	needles
candy papers	macaroni	reflectors	bamboo
bookcovers	paper stars	tree decorations	reed
thread	paper seals	canvas	pipecleaners
yarn	cork	cottons	toothpicks
string	screws	silks	emery boards
newspaper	nails	rayons	rubber bands
cord	tacks	wools	small sticks
ribbon	hooks	terrycloth	saw blades
wire	snaps	oil cloth	broken combs
rickrack	rings	cheese cloth	razor blades
cloth tape	paper clips	vellum	zippers
scotch tape	old keys	felt	bark
rope	gummed labels	sheet cork	hair
raffia	cancelled stamps	lace or net	fur
chains	feathers	buckram	small boxes
aluminum foil	bottle caps	leather	small tiles
seeds	milk tops	burlap	cigar bands

TOOLS AND EQUIPMENT

paint	sandpaper	hammer	brushes
knives	crayons	scissors	coping saw & blades
nails	pliers	tape	tacks
ruler	glue	rubber cement	

ACTIVITIES: ART - DRAWING AND PAINTING

Objectives:

1. To conceive and execute individual ideas.
2. To teach the use of many drawings and painting media and to experiment with procedures in each.
3. To explore the possibilities of combining media.
4. To offer the challenge of expressing ideas with many materials.
5. To offer the opportunity to explore and imagine.
6. To instill habits of closer observation and awareness.
7. To make students aware of the expressive quality of various design elements.
8. To help students learn to locate and use natural objects for field art.
9. To help students in the appreciation of art past and present.
10. Children may learn that natural objects may be combined with commercial products to produce a desired effect.
11. To offer children the opportunity to develop creative and intuitive approaches to problem solving.

Activities - Twenty Art Project Ideas in Drawing and Painting

1. Go outside in good weather and draw houses, trees and the things that are really there. Observe closely. See and draw the obvious things and the detail.

2. Draw small natural objects that the students bring in, see, or gather on a hike. You might find things like a weed, flower, bit of wood or bark, caterpillar, bug, leaf, stone, seed pod or bone. Observe it very closely, draw it carefully with a pencil. See and draw the minute texture and detail.

3. Experiment by using a stick or feather for a drawing tool, use it with ink.

4. Paint a picture or design with as many tools as you can find. Use cardboard strips, string, brushes, sponges, combs, sticks, and scraps for many textures and effects. Overlap color over color - experiment.

5. Make a nature drawing using only dots for contour lines, shading, etc.

6. Heavy black crayon drawings. Fill empty spaces with colored tissue, or colored paper, etc.

7. Paint using Q tips as a painting tool.

8. Make a good scribble drawing. Turn it over and draw a simple shape of a figure, bird, animal, car, etc. Then cut out the shape.

9. Draw by overlapping shapes. Make into a finished composition.

10. Add sand, cereal, seeds, etc., to paint, to experiment with texture in a painting.

11. Do a small tempera painting over burlap. When the tempera dries, stitch around the edges and add other interesting stitched details.

12. Paint on weathered wood, shingles, rocks, shells, etc.

13. Make a contour drawing of a bird, insect, animal, etc. then instead of drawing the textures that are found on the subject, draw several different patterns on the surface inside the contour lines.

14. Draw pictures of various sources of air pollution.

15. Draw pictures of water being used in the home.

16. Make a mural showing people having fun in, on, and near the water.

17. Collect and draw pictures under headings "living things" and "non-living things".

18. Sketch pictures of wild animals.

19. Paint a mural showing a zoo, with zoo animals.

20. Paint a woodland scene after a nature walk.

ACTIVITY: ART - SCULPTURE, CONSTRUCTION AND JEWELRY

Objectives:

1. To offer the challenge of expressing ideas in many three-dimensional media.

2. To offer the opportunity to explore, observe and imagine.

3. To offer the experience of modeling, carving and constructing.

4. To give an understanding of the characteristics of three-dimensional materials.

5. To help students in the appreciation of three-dimensional form - past and present.

Activities: Twelve Art Projects in Sculpture, Construction and Jewelry

1. Mix sand, sawdust, dirt or vermiculite with dry plaster, add water until a meatloaf-like texture occurs. Pour this mixture into strong cardboard boxes or milk containers for a mold. When dry enough to stand alone, rip the cardboard mold off. Carve this shape into desired sculptures before it becomes completely hard.

2. Sand Casting. Work with sand in boxes or go outside to a sandpile. Smooth and dampen sand. Press the shape of a design or figure into the damp sand. Pour plaster gently into this depression. Reinforce with strips of cloth laid into the wet plaster unless the object is small. Lift the plaster out of the sand when hard and brush off loose sand.

3. Make animals, etc. with sawdust and wheat paste.

4. Clay. Incise with natural items as - shells, stones, sticks, bark, plants, seeds, etc.

5. Sand casting is another method of making decorative masks. Dampen sand in a box or sandpile and press features into it. Pour thin plaster into the depression. Reinforcing with strips of cloth or burlap. Imbed a wire to hang it from when finished. When hard, lift it out of the sand and brush it off. It could be painted but is not necessary.

6. Dioramas can be made in almost any subject matter.

7. Jewelry - Macrame or string natural pods, shells, seeds, corn kernals, leather strips, wood spools. Wire, nuts, shells, fruit pits, etc.

8. Make a wooden belt or necklace by taking a branch of a tree about 1" to 1½" in diameter. Saw it across into coin like pieces that are about ¼" thick. Drill two or four holes in each piece. Sand and shellac. When dry run lacing through the holes.

9. Construct kites with original designs.

10. Construct pine cone people and animals.

11. Corn husk can be dampened, twisted, tied and braided to form exciting figures, birds and animals.

12. Corn cobs cut into sections with small lengths of wire inserted into their center for joints can produce interesting animals.

ACTIVITY: SAND PAINTINGS

Discipline Area: Art

Objectives:

1. Children learn to locate and use natural objects for field art.
2. Children may learn that natural objects may be combined with commercial products to produce a desired effect.

Preparation and Supplies:

1. large sheets of cardboard
2. white glue
3. containers for sand
4. possible dry paint powder for coloring sand. Only primary colors
5. pencils for drawing design.

Activity:

1. Children locate and get containers of sand; different colors if possible.
2. If only one colored sand is found, mix small amount of colored powder paint with some of the sand to produce different colors.
3. Draw design on cardboards.
4. Spread white glue on all area to be the same color.
5. Shake sand on cardboard, let stand few minutes, and gently shake.
6. Repeat process for each color.

Evaluation: Each child should complete one project.
Project may be used with the study of southwestern Indians.

Activity: Art - Design, Printing, Weaving, Collage, Mosaics and Experimental.

Objectives:

1. To make children aware of the need for "design" in art and in their everyday living.
2. To make children consider the elements, sources and uses of design.
3. To make children more aware of design in the natural world around him.
4. To explore and learn to use many materials and express ideas with these materials.

Activities: Eighteen Art Projects in Design, Printing, Weaving, Collage, Mosaics and Experimental

1. Natural forms such as leaves (vain side up), grass and weeds can be printed.

2. Crayon rubbings are a form of printing. Simply a rubbing is made by placing a piece of paper over a surface that has lines or textures in relief. The broad side of a crayon is then rubbed over the back of the paper causing the higher lines or textures to appear. Natural objects like leaves, wood grain, etc., are often used for rubbings but rubbings can be made of nearly any object, texture or design. For example, rubbings are often made of relief sculptures carved by ancient civilizations with striking results. Excellent rubbings can be made by cutting a shape out of construction paper. It will show with rubbing. You can make the shape more complicated. It can be an animal, figure, car, etc., repeat it over and over for an overall design. Repeat one or two of these shapes until your own picture or larger idea evolves. A horse repeated can become a "herd" or a "race" or a "farm" etc. Also make a large cut paper picture (any subject) but print many more by making rubbings of it.

3. Found object printing is highly creative and exciting.

4. Make a nature collage or mosaic, using straw, bark, burs, etc.

5. Make paper mosaics of pertinent subjects.

6. Make a Photo Montage.

7. Construct a fabric picture.

8. Take leaves and other nature objects, glue to form a picture. Make leaf people, birds, etc. You can add cut paper and other materials.

9. Make a picture using only seeds. You can find a hundred kinds if you discuss what seeds we use, eat, etc. Observe their color, size and shape.

10. Make a winter bouquet using things found on a nature walk. You can paint or spatter the weeds if you wish. Arrange in a block of damp clay.

11. Make torn paper pictures or designs.

12. Tye-dye - from natural sources - berries, plants etc.

13. Weaving, use any found objects such as sticks, feathers, rope, corn husk, newsprint, scrap fabric, yarn, un-spun wool, reed, stems etc.

14. Lay stencils, masks (the opposite of stencils), leaves, and various other materials on paper and spatter. Move them and spatter with another color. Makes interesting designs, pictures, bookcovers, etc. This is also a good exercise for design.

15. Crayon rubbings can be made by laying stencils, masks (the opposite of stencils), leaves (back side up), coins, keys under thin paper and rubbing across the paper with the side of a crayon. Move articles and rub with another color. Makes fine designs with many uses.

16. Carbon Paper Prints - Place leaf (vain side down) on the carbon side of the carbon paper, which has been placed on a pad of newspapers. Put a sheet of newspaper over it and press for several minutes with an iron set for pressing wool. Then remove the top newspaper and the leaf. Place the leaf carefully on the sheet of paper to be printed, cover and press as before. When the newspaper and leaf are removed, the leaf print will show up very clearly. (The print could be labeled for identification.)

17. Foil Prints - Place a large leaf (vain side up) on a pad of newspapers. Cover the leaf with heavy duty aluminum foil. Then press hard but carefully all over the leaf with the hand, until the outlines of the edges, veins, and stem show up clearly. Cut out the outline carefully and mount it with cellophane tape, or laminate it (and others) between mat-size sheets of wax paper or cellophane. Press the edge with a warm iron to hold it in place.

18. Spiderwed Print - Find a spiderweb where the dew is dryed out. Chase the spider away from it, being careful not to touch the web. Have someone hold a big shield of newspapers behind the web. Then very carefully, spray it on both sides, but lightly, with white paint (enamel works well) or some other color that is light. Don't work too close to the net. You don't want the net to sag with the weight of the paint. When the net is completely sprayed, put a piece of black construction paper behind the web. Very carefully, bring it into contact with the web so that the web will stick to the paper. Then cut the guy lines that anchor the net to the bushes or weeds. Now the web is safely on paper. Let it dry thoroughly - then look at it and marvel at one of nature's masterpieces.

Science Curriculum items that are Environmental Education oriented, presently being taught.

Cycle	Material
2	Lecture: Atmosphere
2	Lecture: Hydrosphere
9	Lecture: Cross section of Earth
9	States of Matter
9	Thermometer Lab--cooling curve
10	Lab: Expansion-Contraction
11	Rocks of Illinois (Lecture)
11	Lecture: Classification of Rocks (3 groups)
11	Lab: Soil Analysis
12	Physical and Chemical Classification of Rocks
12	Lab: Classification of Minerals
12	Lab: Crystallization and Solutions
13	Lecture: Volcanoes
13	Rock Cycle
13	Lab: Making Contour Maps
13	Lab: Reading Contour Maps
14	4-day Rock Identification Lab
15	Lecture: Earthquakes
15	Lecture: Review Rock Cycle
15	Lab: Chemical and Natural Sedimentation
15	Lab: Stereo Books on Rock Types
16	Lecture: Mountain Dome and Volcanic
16	Lecture: Mountains Block & Fold
16	Lab: Folding Plus Stereo Aerial Photos
16	Lab: Clay Models on Faulting
17	4-day Geologic Block Lab & Rocks of Illinois Lab
18	2-day Lab on Plastic Geologic Blocks
19	Sea Geography (Lecture)
19	Lecture: Ocean Currents
19	Lab: Fossils
19	Lab: Film strip Field Trip, California or Rocky Mountain
20	Lecture: Life Zone in Sea
21	Lecture: Continental Drift Theory
21	Lab: Density & Salinity Currents
21	Lecture: Relative Humidity
21	Lecture: Precipitation & Water Cycle
21	Lab: Micro Fossils
21	Lab: Geologic Picture Card of Stream Features
22	Lecture: Erosion
22	Lecture: Old, Mature, and Young Rivers
22	Lab: Condensation Nucleii
22	Lab: Dew Point
23	Lecture: Effects of Glaciers
23	Lecture: Anatomy of a Glacier
23	Lab: Stream Table
23	Lab: Glacial Feature Pictures & Models
24	Lecture: Weather Instruments
24	Lecture: Air Currents & Air Masses

24 Lab: Meterorology Card & Pictures
24 Lab: Stereo Books on Glaciers
25 Lab: Air Mass Generators
25 Lab: Heat Transfer
25 Lab: Heat Absorption
26 Lecture: Weather Maps & Symbols
26 Lecture: Pressure Systems, Continental & Marine
26 Lab: Reading Weather Instruments
26 Pressure Lab
27 Lecture: Storms
27 Lecture: High & Low
27 Lab: Weather Forecasting
28 Lecture: Conduction, Convection, Radiation
28 Lecture: Pressure Demonstration
28 Lab: Read Newspaper Weather Maps

ACTIVITY: ENVIRONMENTAL EDUCATION VOCABULARY I

Discipline Area: Science

Objectives:
1. Students will relate terms to words used in Environmental Education.
2. Students will relate EE problem to pictures.

Activities: Selected pictures are matched with the following statements. Students answer questions from statements or picture.

1. Pollution is something that makes an item unclean or impure.
   Q: What is causing the pollution in the picture? _____

2. Population is the whole number of the same kind of plant or animal in an area or region.
   Q: The size of population depends on _____ and _____ and other factors.

3. Recycled is to return to use again.
   Q: Most _____ metal cans are recycled and again filled with pop.

4. Producers are green plants that take the sun's energy, water, air, and minerals and make food.
   Q: All energy comes from the _____.

5. Species is a particular kind of plant or animal.
   Q: Some _____ have become extinct or endangered.

6. The water cycle includes evaporation, condensation, and precipitation. Organisms are living plants and animals which contain water.
   Q: When something goes in a circle and returns to the beginning, it is called a _____.

7. A consumer is an organism that gets energy from a producer.
   Q: A plant takes energy from the sun and gives it to a grasshopper, which gives it to _____ which gives it to _____.

8. Decay means to rot or decompose.
   Q: As the pictured animals died, the atoms in their bodies were returned to the _____.

9. Ecology is a branch of science which deals with the interrelationship of plants and animals.
   Q: The predator is the _____. The prey is the _____. One parasite is the _____.

10. Erosion is the process of carrying and wearing away.
    Q: The gullies show that _____ is taking place.

11. Environment is everything around an organism (living thing).
Q: Animals living on this hot dessert have _____ as their producers.

12. Habitat: The place where a plant or animal naturally lives.
Q: What meat eating animal also lives on the savanna? _____.

13. Sewage is human waste matter carried off by sewers.
Q: What should be added to this city to stop this pollution?
_____.

14. Extinct means no longer existing.
Q: This mastodon skeleton looks like it was related to the
_____.

15. Fossils are the remains of a plant or animal which has been preserved in the earth's crust.
Q: This picture proves that dinosaurs laid _____.

16. Evolving means natural changes.
Q: Chickens are the relatives of the _____.

17. Soil is the upper layer of the earth's crust.
Q: These humans are farming the _____ by just poking holes in it.

18. Natural resources are usable materials produced by nature.
Q: The natural resources in the picture are the _____.

19. Interdependence of life is plants and animals relying on each other.
Q: Plants provide food, shelter, and oxygen for _____.

20. Depletion is the act of emptying or using up.
Q: As we continue to use the mineral from the gound, they will soon be depleted or _____.

21. Non-renewable means not being able to be made new again.
Q: The gas and oil used in the tractor and cars will be _____ up and cannot be renewed.

22. Succession is the natural process of nature changing.
Q: A farm field, if left alone by man, would turn into a
_____.

23. Organism is a living plant or animal.
Q: Different _____ live in different environments.

24. Earth is a space ship that receives only energy from the sun.
Q: If earth had no plants, it would be impossible for _____ to live because they are interdependent.

ACTIVITY: ENVIRONMENTAL EDUCATION VOCABULARY E-I

Discipline Area: Science

Objectives:
1. Students will relate terms to words used in Environmental Education.
2. Students will relate EE problem to pictures.

Activities: Selected pictures are matched with the following statements. Students answer questions from statements or picture.

E-1. Copper is a natural resource that comes from the ground.
Q: Man is using _____ _____ so fast that there may be none for the future.

E-2. Natural Areas are always changing.
Q: If the owl population becomes too large, the _____ or _____ population would become smaller.

E-3. Ecology is the study of the relationship between plants and animals.
Q: If the lions would be destroyed, the _____ population would increase and eat all the grass.

E-4. Non-renewable is not being able to be made new again. It cannot be recycled.
Q: The _____ in the jet engine is non-renewable.

E-5. Conservation is planned management of natural resources to prevent permanent damage.
Q: The best way to protect our environment is by _____ the people.

E-6. Decay is to destroy by rotting or decomposition.
Q: Bacteria are necessary in our environment to _____ things or all the dead animals would still be lying around.

E-7. Environment is everything around an organism. Man can improve or destroy the environment.
Q: Here man is adding _____ to make the land usable for farming.

E-8. Renewable is anything that can be made new again.
Q: This _____ tower holds a liquid that has been used, then cleaned, and then reused since the beginning of the earth's formation.

E-9. Living plants are the producers that take water, minerals, carbon dioxide, and sun's energy to provide food for the consumer.
Q: The _____ farm grows plants to be used at Christmas and keeps replanting to form a usable natural resource.

E-10. Contour farming and strip cropping is used on hills to stop soil from washing away.
Q: Erosion on hills is slowed up by _____ and _____.

E-11. A human is a man (person). He is one kind of species.
A: The food chain for this baby is as follows: sun--_____--cow--milk--human.

E-12. A multiple use area is one that can be used for more than one thing.
Q: The Oak Ridge Reservoir can be used for recreation, animal sanctuary, park, and a source of _____ for the city.

E-13. Water treatment plants clean and purify the water to make it safe to drink.
Q: The sand and gravel _____ out the solid material in the water.

E-14. Sewage can pollute the water supply because it is human waste.
Q: Another source of pollution on a farm could be _____ waste.

E-15. Consumers are animals that eat plants or other animals.
Q: When the winter snows cut the food supply low, many of the elk will _____.

E-16. Interdependence is the need of one organism for another.
Q: The owl _____ on the rabbit for food. The rabbit depends on plants for food.

E-17. Succession is the natural change in an area starting from bare rock.
Q: This land has little rainfall and therefore can support only grassland. There are no trees because there is not enough _____.

E-18. Soil is the upper layer of the earth's crust.
Q: _____ and _____ mixed together forms soil.

E-19. Energy is the ability to do work.
Q: When we eat these foods, we are eating energy from the _____.

E-20. A habitat is a place where animals naturally live.
Q: The animals live in a habitat that includes a _____.

E-21. Nonliving things were never born, grown, or users of food.
Q: The materials shown in the picture were all once alive except the _____.

E-22, Living things are able to eat, use oxygen, reproduce, and live for a time span.
Q: The mouse in jar _____ will live the longest, if the jar is not lifted.

E-23. Dependent means that one organism needs another in order to survive.
Q: The horned lizard depends on the _____, and the ant depends on the _____.

E-24. Ignorance is when someone doesn't know or understand something.
Q: The farmer built a pond which drowned the _____.

KEEPING IN TOUCH WITH NATURE (SENSES)

Objective: Students will understand that all our senses work together to help us become aware of our environment.

	Observations Weather	Observations Living Things	Observations Non-living Things	Your Feelings about Conversation
Sight				
Sound				
Touch				
Smell				
Taste (not recommended for people with allergies)				

Feelings (Examples: good, bad, sad, happy, don't care, etc.)

What happens when one of the senses is eliminated?

1. cover eyes
2. plug ears
3. tie hands behind back (or) wear gloves
4. hold nose
5. keep mouth closed

Does taking away one of our senses decrease our appreciation of our environment?

SCHOOL SITE EROSION AND WEATHERING STUDY

DISCIPLINE AREA: Science

OBJECTIVE: To see features and relate them to terms in the study of erosion and weathering on school site.

Students are to look for features and explain their meanings.

Drainage pattern

Gully erosion

Sheet erosion

Grass waterway

Weathering

Erosion

Frost wedging

Faulting

Flood plain

Structural erosion

Chemical weathering

Mechanical weathering

Root pry

ACTIVITY: PLANT AND ANIMAL IDENTIFICATI..

Discipline Area: Science

Purpose: To broaden the pupil's ability to observe and name animal and plant life which is part of his environment.

Objectives: The student will show an increase in his awareness of the plant and animal life of his environment by identifying at least 50% of the plants and animals or animal signs found in the neighborhood.

Learning Acitivity:

Neighborhood Study

Each pupil has a chart to be filled in. Some neighborhoods will be richer than others, but all should be able to fill part of the chart. Animal signs may be used. This is a good exercise in the use of reference works. Your parents or guardians may help you with this exercise.

Mammals	Birds	Insects and Other Animals	Plants

Modified from Upper Mississippi River ECO-Center

Stories Used to Spark an Environmental Discussion

From The Houghton Mifflin Reading Series

Page	Title	Environmental Problem Discussed
	Rewards:	
175	Spiders Are Spinners	Worth While Animals
210	Hawaii	Preserving National Environmnet
	Panorama:	
86	Ant Eaters	Unusual Animals
138	Song of The Open Road	Trees
139	Henry Ford	Cars
182	Burning of The Rice Fields	Natural Disasters
196	Magic in A Glass Jar	Allowing Animals to Be Free
236	How D. Y. B. Worked for April	People Working Together & City Life vs. Country Life
292	McBroom Tells The Truth	Nonproductive land changed to worthwhile land
	Fiesta:	
138	A House for Aquanauts	Use of undersea for living
200	Marco Comes Late	Observing nature around us
206	Two Weeks Old and On His Own	Survival of small field mouse
223	The Leaf Pile	
240	Camel In The Sea	Drought
316	Desert Traders	Animal survival
	Kaleidoscope:	
157	The Sea Turtle	Wildlife refuges
209	Scrappers of The Sky	Preserving some light and green trees in the cities
234	Those Amazing Atoms	Precious fuels
254	Rudolph is Tired of The City	Clean air, space to play
255	A New Baby in The Zoo	Rare animals
312	Troubles With A Penguin	Animals natural habitat, appropriate pets
330	Arap Sang and The Cranes	Endangered species
376	Web Weavers	Spiders help keep natural balance

Page	Title	Environmental Problem Discussed
	Kaleidoscope:(Cont.)	
413	Tornadoes and Hurricanes	Natural disasters
	Images:	
87	Treasure Overboard	Reclaiming
181	Our Friends, The Bees, Wasps, and Hornets	Benefits of having the insects
242	From Supercold to Superheat	Temperature
267	Whale Hunt	Catch and process whales
365	Off To His Den'O	Red Fox
388	Mustangs, The Wild Horses	Mustang horse
426	The Computer Triumphs Again	Use of a computer
	Galaxies:	
50	Poisonous Snakes in The U.S.	Points out various types of snakes
71	An Eskimo Boy's Courage	Survival in a wilderness
121	Discovering the Shape of The Earth	Goes into the early discoverers of the earth and a small background of theories
216	Gramma's Flowerpot	About a family who moved from open spaces of Kentucky to Chicago
239	Volcanoes: Windows in The Earth	True article about how volcanoes formed and what causes eruption.
270	Edison: Wizard of Light	Tells about life of Edison and his invention
284	Hunting The Giant	Living on an Island and searching for food
	Devilfish	Problems encountered with wild animals, zoo....
81	Survival: 3000 A.D.	How we might live in the future
434	Gertie The Scatter	True story about duck in Milwaukee; hatched eggs
467	How You'll Travel in Outer Space	Types of Travel in the future

Page	Title	Environmental Problem Discussed
	Serendipity:	
4	Carlos Charles	Man's struggle for survival
20	Great Storm	Natural disaster
32	Street Kids	Gardening man's environment
45	Tsunami	Tidal wave
80	Iceberg Cometh	Source of fresh water
109	Blueprint for Survival	Animal survival
118	Navaho Rain	Killing of trees
209	Lesson of The Learning	Population explosions
251	Two Years in The Woods	Man and nature
256	My Side of The Mountain	Man and nature
375	Giants of The Earth	Vanishing animals
422	Life On Other World	Universe
504	Meet The Armored	Armadillo's extinction

LANGUAGE ARTS

(Book Reporting)

ACTIVITY: ECO book reporting (Used in language arts skills class)

Objective: Students will choose and read a book that has an environmental theme.

Students will give an oral report to members of their group on this book.

Activities:

1. Students are to choose a book with an environmental theme or a nature theme and read it.
2. Students will present an oral report to their Language Arts Skills group.
3. Other students in their group will ask questions and discuss the environmental issues presented in the oral report.

(Dramatization)

ACTIVITY: In class: Write and act out your own script, making a solution to an environmental problem. (This activity may take two weeks.)

Objective: Students will be able to choose an environmental problem and work on a feasible solution to it. Students will be able to work together to find that solution and dramatize it.

Activities:

1. Students are to write their own script posing a solution to an environmental problem. (Groups of three to five students)
2. Students will practice their skits and make any props necessary.
3. Students will then present their skit to the rest of the class.
4. Class will discuss the solution and how possible it would be.

LANGUAGE ARTS

(Creative Writing)

ACTIVITY: School site use: observation of something students hadn't noticed before.

Objective: Students will carefully look around their school grounds to notice something about it that they had never seen before.

Activities:

1. You are going to be a detective today. As you are walking around school, be on the lookout for something that you've never seen before. Look at it very carefully and remember as much about that thing as you can.

2. When you are back in the room, write about the new thing that you saw. Describe it, draw it, and tell why you think that you never noticed it before.

- - - - -

ACTIVITY: In class: using student's imagination for two "What If" problems.

Objective: Students will be able to write some logical problems that would occur if these two following situations would happen.

Activities: Write the problems you would see if:

1. A new rubber factory (like Kelly-Springfield) is going to be built behind our football field. How would that factory affect our school? Environment? You?

2. You went on a walk, but you can't smell anything and/or hear anything. What would you miss by losing one or both of these senses? How would you try to make up for it?

- - - - -

ACTIVITY: In class or school site use: five senses and words that can be categorized.

Objective: Students will be able to identify words that fit into the categories of feel, hear, taste, smell, see. Students will add to each list using their own senses.

Activities:

1. Use this list of descriptive words and put them into the best category.
2. Add at least two more words of your own to each category.

snapping	ugly	chirp	red
springy	rough	tall	noisy
dry	sharp	chilly	musty
fast	rattly	smoky	sweet
yellow	rotten	plain	gritty
windy	crisp	quiet	sour
damp	leaving	wooly	dull
bent	sticky	mint	slippery
grooved	sweet	square	cold
warm	strong	high	fishy
heavy	quick	fat	steep

FEEL	HEAR	TASTE	SMELL	SEE

LANGUAGE ARTS

ACTIVITY: In class: Prefix, Suffix (Re-, non-, -able)

Objective:

1. Students will learn the meanings for the prefix re-, non-, and the suffix -able through examples.
2. Students will be able to build their own words using this prefix and/or suffix.
3. Students will use their definitions of re-, non-, and -able to determine environmental meanings for their new words.

Activities: We stopped at a gas station to refuel our car. What does refuel mean? 1._____ What does the prefix re mean? 2._____ We hiked two miles nonstop. On our way back, we had to stop twice. What does nonstop mean? 3._____ _____ What does the prefix non- mean? 4._____ That soil is very workable as it grows many things well. What does workable mean? 5._____ What does the sufix -able mean? 6._____

4. Now, use what you've learned to answer these questions. Think environmentally!

"New" means 7._____ Add re- to new 8._____ _____ and the new meaning is 9._____ Now add -able to this word. What do you have? 10._____ What is the new meaning for this word? 11._____ Can you add non- to this entire word? 12._____ Write that whole word. 13._____ _____ How does non- change its meaning? 14._____ _____ Write a sentence using either renewable or non-renewable. 15._____

Turn means 16._____ Add the suffix -able to turn and you have 17._____. What does this word mean? 18._____. Now add the prefix re- to the word. 19._____. What does this whole new word mean? 20._____ If you add non- to it, how does the meaning change? 21._____ _____ Use returnable in a sentence. 22._____ _____

Cycle means 23._____ Add re- to it, 24._____ _____ and write the meaning. 25. Add -able to it. What word to you get? 26._____ What is the meaning of this word? 27._____ Use recyclable in a sentence. 28._____

What things in nature are renewable? 29._____ Nonrenewable? 30._____ What things in nature are returnable? 31._____ _____ What things in your home can be recycled? 32._____

TAKE HOME AND SCHOOL ACTIVITY

Objective: Students will judge for themselves the way utilities affect the beauty of their home and/or school environment.

Beautification and Utilities

How do they relate to one another?

Can you find these utilities at or near	home?	school?
Electric wires	_____	_____
Power poles	_____	_____
Transformers	_____	_____
Telephone poles	_____	_____
Cable TV wires	_____	_____
TV antennae	_____	_____

How is your home heated?_____. How is the school heated?_____. Is there a fuel meter at your home? _____. Can you read it? _____. Can you find and read your water meter?_____; your electric meter? _____.

How do these utilities affect the beauty of your home or neighborhood?

Utilities	Adds to Beauty	Detracts	How?
Telephone poles			
Telephone or electric wires			
Cable TV wires			
Transformers			
TV antennae			

Additional comments about beauty and the utilities:

*Environmentally - oriented textbook work.

pp. 74 - 81	Using Metric Measures
pp. 86	Using Addition of Decimals; Money
pp. 92 - 95	Using Decimals: The '72 Summer Olympics
pp. 100	Using Math: Travel
pp. 134	Using Fractions in Experiments
pp. 136	Logic Patterns
pp. 143	Using Addition of Fractions and Mixed Numbers: Measures
pp. 144	Using Addition of Mixed Numbers: Distances
pp. 152	Using Addition and Subtraction of Mixed Numbers: Measurement
pp. 154	Using a Table to Solve a Puzzle
pp. 156 - 160	Perimeters: Changing Dimensions
pp. 162 - 168	Area: Changing Dimensions
pp. 182 - 183	Using Multiplication of Fractions: Probability
pp. 184	Using Multiplication of Fractions: Statistics
pp. 199	Using Multiplication of Decimals: Patterns
pp. 200 - 201	Using Multiplication of Decimals: Speeds
pp. 204 - 205	Using Multiplication of Decimals: Metric Measures
pp. 206	Using Multiplication of Decimals: Eating Out
pp. 208	Using Multiplication of Decimals: Railroad Models
pp. 210	Using Multiplication of Decimals: Money
pp. 214	Using Mathematics: An Animal Shelter
pp. 250 - 252	Using Dimension of Decimals: Metric Measures
pp. 253	Dividing Decimals: Money
pp. 256	Using Pictures to Divide Fractions
pp. 262 - 266	Percents
pp. 267	Using Percent: Geography
pp. 268	Using Percent: Basketball
pp. 269	The Magic Percent Game
pp. 272	Using Percent: Circle Graphs
pp. 276 - 277	Using Percent to Find Discounts
pp. 278	Using Percent to Find Sale Price
pp. 280 - 281	Using Percent: Scuba Diving
pp. 282 - 283	Using Percent: Sports
pp. 282 - 283	Using Percent: Sports
pp. 284	Percent Computer
pp. 286	Using Mathematics: Food Buying
pp. 294	Using Circumference and Diameter: The Planets
pp. 298	Making Circle Graphs
pp. 314 - 315	Using Ratios to Solve Problems: Future Transportation
pp. 316 - 317	Using Ratios: Health

*TEXTBOOK: Mathematics Around Us, Scott, Foresman and Company, 1975

pp. 318 - 319	Using Ratios: Similar Figures
pp. 320 - 321	Using Ratios: Movie Film
pp. 322	Using Math: A Class Play
pp. 326	Using Positive and Negative Numbers: Temperature
pp. 342 - 347	Making and Using Line Graphs to Solve Problems

METRIC STUDIES

Co-ordination with textbook and workbook pages

a. Text: pp. 74 - 81, 204 - 205, 249 - 251

b. Workbook: pp. 33 - 34, 77 - 79, 92

ACTIVITY: THE COST OF POLLUTION

Discipline Area: Mathematics

Objectives:

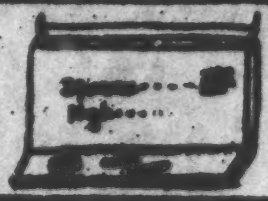
1. Pupils will use mathematics to determine what pollution is costing.
2. Pupils will relate mathematics to real life situations.

Activities:

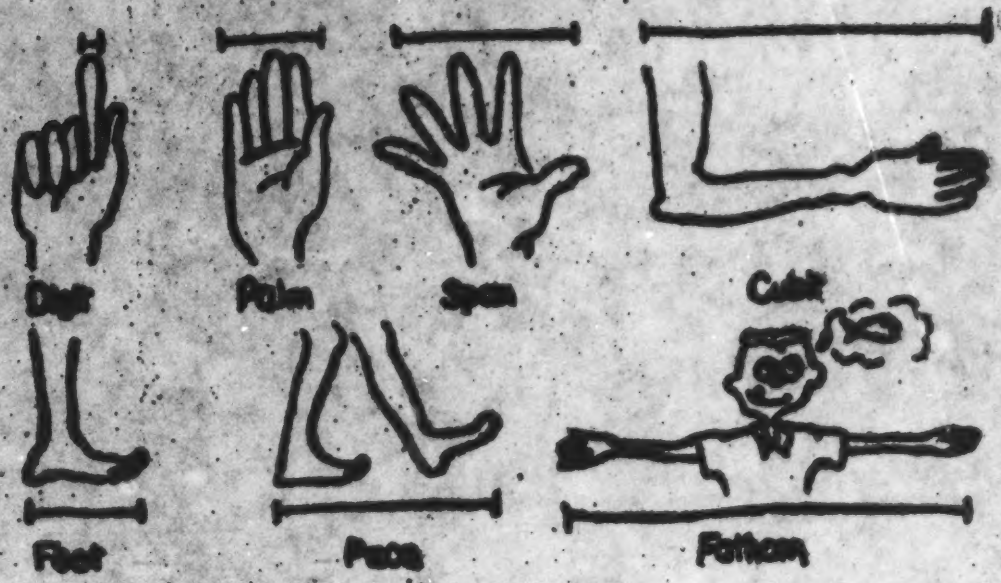
1. If it costs 35 cents for each piece of roadside litter picked up, how much will a six pack of discarded beer cans cost?
2. If you pick up 10 pieces of roadside litter, how much will you save the taxpayers? If each member of the class does that, how much is saved?
3. If it costs each family $3.50 per month for trash pick up, how much does it cost for 50 families?
4. If you pick up 10 returnable bottles and get 5 cents each, how much do you make?
5. At 35 cents each for roadside trash pickup, how much did you save the taxpayer?
6. If recyclable aluminum is worth $200 a ton, how many canoes at $100 each can you buy with the money from a ton of aluminum?
7. If your class brings in 20 pounds of wastepaper a day, how long will it take you to collect a ton?
8. If clean water can save a family $87 a year, how much could clean water save the families of pupils in this class?
9. If strip mining destroys 4000 acres of land a week, how many acres are destroyed in a year?
10. If automobiles cause 52% of the air pollution, how much pollution comes from other sources?

(Evaluation: 75% of pupils should have 70% of problems right.)

ME AS A MEASURE

What to measure	Guess	Measurement
Door		
Desk Top		
Desk Height		
Chalkboard 		
Book		

BODY MEASURES



_____ digits make a palm.

_____ digits make a span.

_____ digits make a foot.

_____ palms make a cubit.

_____ paces make a pace.

_____ palms make a fathom.

_____ feet make a pace.

_____ feet make a fathom.

_____ spans make a cubit.

_____ spans make a fathom.

Which is bigger, a foot or a palm? _____

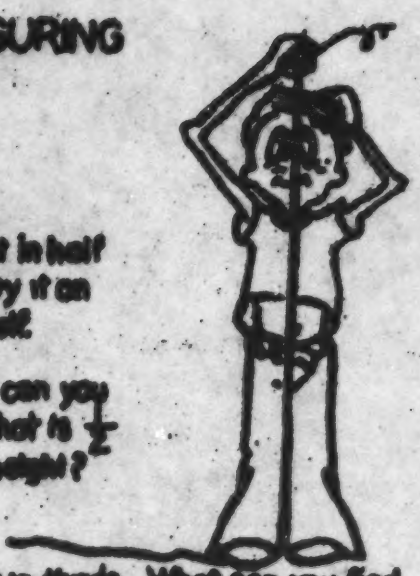
Which is bigger, a foot or a span? _____

MERRY MEASURING

Cut a piece of string equal to your height.

Fold it in half and try it on yourself.

What can you find that is $\frac{1}{2}$ your height?



Fold it in thirds. What can you find that's $\frac{1}{3}$ your height? $\frac{1}{4}$? $\frac{1}{5}$? What else?

RECORD HERE →

$\frac{1}{2}$ my height	$\frac{1}{3}$ my height	$\frac{1}{4}$ my height	$\frac{1}{5}$ my height	What else?

BODY RATIOS

COMPARE YOUR BODY MEASURES.

RECORD LIKE THIS ——→

FOOT TO HEIGHT = 6:1

AROUND WRIST TO HEIGHT = _____

AROUND WRIST TO WAIST = _____

AROUND HEAD TO HEIGHT = _____

AROUND FIST TO WAIST = _____

AROUND WRIST TO NECK = _____

AROUND NECK TO ARM = _____

ARM TO HEIGHT = _____

AROUND FIST TO FOOT = _____

FOOT TO ARM = _____

AROUND NECK TO HEIGHT = _____

COMPARE YOUR RATIOS WITH A FRIEND'S RATIOS.

M-8

ACTIVITY: USES OF ENERGY IN THE HOME

DISCIPLINE AREA: Mathematics

Activities:

1. Children will be given a list of energy users in the home. Each will check whether it uses electricity or gas (or some other source), check if they have it in their homes, and then ask their parents and grandparents (or someone of approximate age) to check those in their homes when they were children.

2. Children will learn the names of the companies supplying their energy.

3. Children will find out what each company uses as its source of energy, and where the company gets its supply.

4. Children will prepare graphs showing the growth in the use of energy from approximately 1915 to the present time.

5. Children will prepare graphs showing prevalence of selected current appliances.

APPLIANCE	TYPE OF ENERGY	NOW	ABOUT 1950	ABOUT 1920
stove				
lights				
refrigerator				
television				
radio				
water heater				
freezer				
clothes dryer				
fan				
furnace				
vacuum cleaner				
washer				
air conditioner				
hair dryer				
toaster				
fry pan				
organ				
dishwasher				
blender				
mixer				
toothbrush				
saw				
sander				
power tools				
garbage disposal				
garbage compactor				
blanket				
phonograph				
razor				
knife				
hedge trimmer				
garage door opener				

Can you think of others? Continue this chart on the back.

ACTIVITY: YARD CENSUS

Discipline Area: Mathematics

Purpose: To help the student develop an awareness of the infinite variety of natural and man-made objects which are part of the home yard environment.

Objectives: The student will:

1. Demonstrate his power of observation to identify natural and man-made objects in his yard at home.
2. Display his aesthetic values by pointing out those items which have low aesthetic value and those which have high aesthetic value.

Learning Activity: Many of you may have heard of the "people" census that the government takes every 10 years. In your yard there are many living things. There are also many things that man has put on the school site. Below is a check list. Take a walk around your yard and check off all of the things you see.

Plants or Animals

ant or ant hill	_____	dandelion	_____	fence	_____
squirrel nest	_____	clover	_____	sidewalk	_____
wasp nests	_____	wild strawberry	_____	lichen	_____
holes in ground made by insect	_____	insects on bark of tree	_____	broadleaf tree	_____
bird nest	_____	bee	_____	evergreen	_____
bird	_____	crab grass	_____	mushroom	_____
animal print	_____	moss	_____	tree-fruit	_____
half eaten leaf	_____	shrub	_____	trash cans	_____
spider	_____	vine	_____	fire plug	_____
grasshopper	_____	a yellow weed	_____	gutter	_____
				light meter	_____

Which animal do you think is the most numerous in the yard?_____

Which plant has the greatest number?_____Why does this plant grow so well in your yard?_____.

Which of the man made items are pretty?_____Which are ugly?_____

Could the ugly ones be made better looking?_____How?_____

ACTIVITY: POLLUTION

Discipline Area: Mathematics

Purpose: To make the student aware of pollution, he is contributing to the total community and U.S. problem.

Objectives: The student will:

1. Be relating mathematics to real life
2. Develop an attitude for responsibility toward personal resourcefulness
3. Suggest how increased population growth will affect the pollution problem
4. Compute problems on pollution

Learning Activities:

a. Invite a possible resource person from the local landfill site to explain the operation of the site.

b. Use the statistics presented in the following examples:

1) The population of our community is _____ and _____tons of garbage per _____ are collected. (day, week)

What is amount of garbage collected in a month?

2) If you contribute 6 pounds of garbage per day, how much will you have contributed in a month? _____in a year?_____

3) 48 tons of garbage are taken to the landfill by a five ton truck, how many trips were made?_____

4) It took two years to fill 1/6 of the site, how many years will it take to fill the entire site at this rate?_____

5) The U.S. spends $4 billion on garbage collection and disposal. If $3,200,000 is spent for the collection, how much is left to spend for disposal?

_____

6) Rats are a problem at a landfill site. If a female rat has nine litters per year with 12 baby rats per litter, how many off-spring will she produce in a year?_____

7) Cars add to our pollution problem.

Four fathers drive to work daily to _____. (nearby city)

Each car used 4 gallons of gasoline per day. How much gasoline could be saved if all four fathers rode in one car?_____

ACTIVITY: SCHOOL SITE USE

Discipline Area: Mathematics

Purpose: To help the student develop his sense of estimating distance and his ability to work with different types of measurements.

Objective: The student will:

1. demonstrate his ability to estimate length, width, height, diameter and weight.
2. demonstrate his ability to use different tools and skills to determine the actual length, width, height, diameter or weight of item.

Distance and Heights

1. Guess what the distance is between the street and the front door of the school	Your guess _____ ft.	_____ m
	Actual _____ ft.	_____ m
2. Guess the width of the school	Your guess _____ ft.	_____ m
	Actual _____ ft.	_____ m
3. Guess the height of the school	Your guess _____ ft.	_____ m
	Actual _____ ft.	_____ m
4. Guess the weight of a rock	Your guess _____ lbs.	_____ kg
	Actual _____ lbs.	_____ kg
5. Guess the length of one bike rack	Your guess _____ ft.	_____ m
	Actual _____ ft.	_____ m
6. Guess the height of the flag pole	Your guess _____ ft.	_____ m
	Actual _____ ft.	_____ m
7. Guess the circumference of a tree	Your guess _____ ft.	_____ cm
	Actual _____ ft.	_____ cm
8. Guess the height of the back door of the school	Your guess _____ ft.	_____ cm
	Actual _____ ft.	_____ cm
9. Guess the weight of a block of wood	Your guess _____ lbs.	_____ g
	Actual _____ lbs.	_____ g
10. Guess the weight of a friend	Your guess _____ lbs.	_____ kg
	Actual _____ lbs.	_____ kg

Repeat #4, #7, #9 and #10 with second rock, tree, block and friend.

(It will be necessary to have a tape measure handy so the children can measure the actual distance. Some helpful hints on how to measure heights are also nice to have.)

ACTIVITY: MAPPING SMALL PLACES

Discipline Area: Mathematics

Objective:

1. Children learn to take compass bearings
2. Children learn to put compass study to practical use.

Materials Needed:

1. small flags
2. compasses
3. tape for measuring pace
4. map sheets with square drawn to scale

Preparation:

1. Children measure length of pace on marked course.
2. Children learn to read compasses.
3. Mark square area to be mapped.

Activity:

1. Pairs are assigned stations on perimeter of square.
2. Children take compass bearing on each object within square to be marked on maps.
3. Children measure distance from perimeter.
4. To object by pacing and then compute in feet for maps.
5. Children mark maps showing locations as computed.

Evaluation: Children check maps against each others and check with teacher's master copy.

This exercise may have to be repeated several times before accurate measurement can be taken.

ACTIVITY: ESTIMATING THE HEIGHTS OF TREES AND BUILDINGS

Discipline Area: Mathematics

Objective: 1. By using mathematics in the outdoors children will better understand the relationship of mathematics in their daily lives.

Activities: Height of a tree or of a building can be estimated in several ways -

1. Inch to Foot - Starting from the tree (a), walk 11 steps or measure 11 units and mark the end point (X) with a long perpendicular stick; then measure one unit more and mark that point (b). Sight from point (b) across the stick to the top of the tree. Mark on the stick the point where your line of vision intersects the stick (y). Measure the distance from point (X) to point (y) in inches. This will be the height of the tree, in feet.

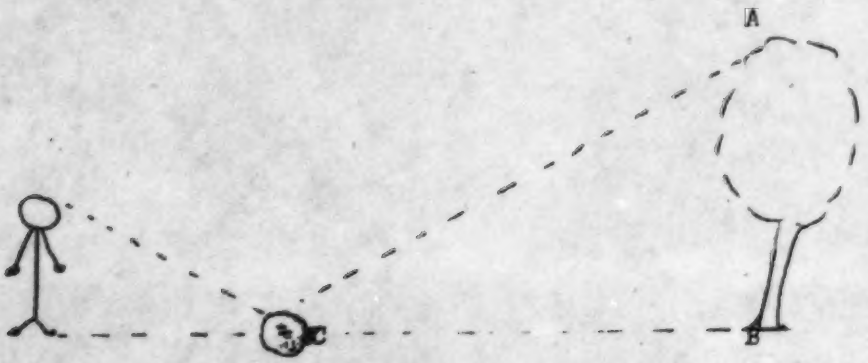
2. Pencil Method - Have a friend of known height stand beside the tree. Stand at a distance from him and hold a pencil or short stick at arms length and sight across the top of it to point (y). Slide your thumb up or down on the stick until you are able to sight across the top of the thumb (b) to point (X). Keep your thumb here the remainder of the method. Move the pencil upward until you can sight across the top of your thumb to point (y). Now sight across the top of your stick to a new point on the tree. Repeat this until you have reached the top, keeping track of the number of measurement (xy) you have gotten. The height of the tree is this number times the known height of the person acting as a measurement.

3. Shadow-Ratio Method - Measure the length of the tree's shadow (BA). Place a stick in a perpendicular position from the ground and measure its shadow. Both should be on the same slope. In the two similar triangles (CBA) and (ZYX) you now know two sides of the smaller and one side of the larger so a problem can be made: CB/ZY - BA/YX or $\frac{ZY \times BA}{YX}$.

4. Biltmore Method - Glue a strip of hard paper or cardboard on one side of a yardstick. Begin at one end and make marks 6.15 inches apart and number the stick vertically at 25" from eye. Slide the stick up or down until the top of the stick is in line with the top of the tree. Without moving the head, sight to the bottom of the tree and see the place on the stick where the line of sight crosses it. Each number means a 16 feet length.

5. Muddy Water Method - Place a basin of muddy water on the ground, between you and the tree. Step back from the basin, a distance equal to that from your eyes to the ground. You should see the top of the tree reflected in the water. If not, move the basin back until this is possible. The distance from the basin to the foot of the tree is the height.

When AC - HE then BH - AB



ACTIVITY: YARD CENSUS

Discipline Area: Mathematics

Purpose: To help the student develop an awareness of the infinite variety of natural and man-made objects which are part of the school site environment.

Objectives: The student will:

1. demonstrate his power of observation to identify natural and man-made objects on the school grounds.

2. display his aesthetic values by pointing out those items which have low aesthetic value and those which have high aesthetic value.

Learning Activity: Many of you may have heard of the "people" census that the government takes every 10 years. In your yard there are many living things. There are also many things that man has put on the school site. Below is a check list. Take a walk around your yard and check off all of the things you see.

Plants or Animals

ant or ant hill	____	dandelion	____	flagpole	____
squirrel nest	____	clover	____	fence	____
wasp nests	____	wild strawberry	____	telephone pole	____
holes in ground made by insect	____	crab grass	____	sidewalk	____
bird nest	____	moss	____	parking lot	____
bird	____	shrub	____	play area	____
animal print	____	vine	____	trash cans	____
half eaten leaf	____	a yellow weed	____	fire plug	____
spider	____	lichen	____	stop signs	____
earthworm	____	gall	____	bicycle rack	____
grasshopper	____	evergreen	____	gutter	____
bee	____	broadleaf tree	____	light meter	____
insects on bark of tree	____	mushroom	____	transformer	____
pill bug(sowbugs)	____	tree-fruit	____	cement area (blacktop)	____

Which animal do you think is the most numerous on the site? ____
Which plant has the greatest number?____Why does this plant grow so well on the school site?
Which of the man-made items are pretty?____Which are ugly?____Could the ugly ones be made better looking?____How?_____

no page 16 in original

MEASURING KIT

Sirections:

1. Each person copy this chart on his own paper.
2. Each person measure each item.
3. Record the measure of each item in millimeters.
4. Change mm measure to centimeters by dividing by 10.
   eg. 63 mm - 6.3 cm

   Change each cm measure to decimeters by dividing by 10.
   eg. 27 cm - 2.7 dm

ITEM TO MEASURE	MEASURE IN MILLIMETERS	CHANGE TO CENTIMETERS	CHANGE TO DECIMETERS
1. paper clip			
2. paper fastener			
3. string			
4. straw			
5. piece of cloth			
6. pen			
7. length of envelope			
8. width of envelope			
9. toothpick			
10. index card-width			
11. index card-length			
12. playing card-length			
13. playing card-width			

SOCIAL STUDIES

ENVIRONMENTAL CONCEPTS

The following is a list of environment concepts that are presented in "Man: A Course of Study". The concept is only listed the first time it is introduced in this curriculum; it may be reintroduced in various other lessons.

CONCEPT	UNIT	LESSON PLAN
	Salmon and Herring Gull	
life cycle		1
river		3
ocean		3
directions		3
coast		3
continent		3
environment		3
information		4
animal		4
territory		5
interaction		5
natural selection		9
adaptation		9
species		9
survival		12
	Baboons	
equator		1
predator		1
climate		1
plains		1
plant life		1
gorges		1a
carnivore		1a
herbivore		1a
independent		2
dominance		2
hierachy		5
offspring		7
range		8
boundaries		8
habitat		8
communication		9
	Netsilik Eskimos at the Island Camps	
island		1
isthmus		1
peninsula		1
seasons		3
hemisphere		3
temperature		3
precipitation		3
migration		4

CONCEPT	UNIT	LESSON PLAN
	Eskimos Continued	
conservation		4
scarcity		4
pollution		7
tools		7
social environment		7
physical environment		7
food chain		9
cost		10
natural resources		11
supply and demand		11
	The Netsilik Eskimos on the Sea Ice	
distribution		5

GEOGRAPHY

The following lists environmental concepts that will be taught in a practical skills geography unit that is presently being developed.

- -longitude
- -latitude
- -scale and comparative size
- -symbol skills (physical features)
- -water terms
- -land area terms
- -directions (4 cardinal and intermediate directions)
- -rotation of the earth - seasons

Activities: Ten-Minute Field Hikes
(These exercises are designed to increase the children's power of observation by using all the senses.

Discipline Area: Interdisciplinary

Grade Level: Primary, intermediate

Objectives: 1. The children will develop a greater awareness of their environment by using their senses.

Materials Needed: clipboards
worksheets
pencils

Procedure: Each worksheet is self-explanatory.

WORKSHEET

How many of the following things did you see on your hike? If you can name the kind, do so.

Mammals	Birds	Insects and other small animals	Plants
Dogs	Sparrows	Earthworms	Trees
Cats	Robins	Spiders	Bushes
Rats	Pigeons	Ants	Flowers
Squirrels	Starlings	Roaches	Grass
Horses	Bluejays	Flies	Moss
Mice	Cardinals	Butterflies	Lichens

Taken From Upper Mississippi River Eco-Center

SS-4

TRY THIS AROUND YOUR SCHOOL OR PARK WITH YOUR STUDENTS AS A SIMPLE OUTDOOR EDUCATION ACTIVITY OR MAKE UP YOUR OWN.

NAME_____ DATE_____

WEATHER

A. Clear & Sunny
B. Dark & Rainy
C. Windy & Dark
D. Windy & Clear
E. Other

THINGS HAPPENING

_____1. An insect walking
_____2. A tree budding
_____3. A spider web
_____4. Water working
_____5. (Add other items)

THINGS TO TASTE

_____1. Evergreen tree needle
_____2. A piece of tree bark
_____3. Evergreen tree sap
_____4. Sumac berry
_____5. (Add other items)

THINGS TO SMELL

_____1. Clean air
_____2. A hole
_____3. Crushed evergreen needle
_____4. Dirt
_____5. An unpleasant smell
_____6. A pleasant smell
_____7. (Add other items)

THINGS TO SEE

_____1. A bird
_____2. Evergreen tree
_____3. Raccoon tracks
_____4. A seed
_____5. Insect house
_____6. Lichens
_____7. A white tree
_____8. Gall
_____9. White oak leaf
_____10. Red oak leaf
_____11. A pond creature
_____12. Old birds' nest
_____13. Other tracks
_____14. A feather
_____15. (Add other items)

THINGS TO HEAR

_____1. Wind in trees
_____2. Machine sounds
_____3. Bird singing
_____4. Water running
_____5. Leaves rustling
_____6. Animal calling
_____7. Farm animal noise
_____8. (Add other items)

THINGS TO FEEL

_____1. Prickly plant
_____2. Warmth from sun
_____3. Wind
_____4. Smooth bark
_____5. Rough bark
_____6. Running water
_____7. Moss on rocks
_____8. Rotten wood
_____9. (Add other items)

This activity was borrowed from the Bettendorf Outdoor Education Program. Then from Upper Mississippi Eco-Center.

SS-5

OUTDOOR HUNT

1.	Find and pick up two pieces of litter	2 pts.
2.	Find two different trees	2 pts.
3.	Identify the two trees you found	1 pt. bonus
4.	Find two different shrubs	2 pts.
5.	Identify the two shrubs you found	1 pt. bonus
6.	Find signs of two animal homes on the school grounds	2 pts.
7.	Find some animal tracks on the school grounds	1 pt. bonus
8.	Find an outside trash can and put the litter you picked up in it.	2 pts.
9.	Find an outside bird feeder on the school grounds	2 pts.
10.	If there is not a feeder on the school grounds why don't you and your classmates build one later.	5 pt. bonus
11.	Think of two adjectives describing the weather	2 pts.
12.	Think of two adjectives describing the grass	2 pts.
13.	Think of two adjectives describing the trees	2 pts.
14.	Write two different words describing TWO different sounds you heard while on the school grounds.	2 pts.
15.	Name two insects you saw on the school grounds	2 pts.

(Each teacher should coordinate the rules for the hunt to fit his or her own school site.)

Taken from Upper Mississippi Eco-Center

SCHOOL SITE LESSON PLAN

Activity: Carl Sandburg Environment Study

Discipline Area: Social Studies

Objectives: Student will be able to identify changes that have been made in the Sandburg environment to develop an educational use area.

Materials Needed: Pencil worksheets

Activity: Students will work individually using worksheets* Then after a designated time, the students will compare responses.

WORKSHEET*

Today, you are asked to fill out sheets dealing with the changes necessary to make a school area and the effect of these changes on the environment.

I. List five (5) things that had to be done before this area could become a school area.

A.
B.
C.
D.
E.

II. Give a brief description of the land, how you imagined it looked before the school._____

_____

_____

III. With the changes in the Sandburg environment (the way it is presently) how do you think it affected (also give reason for your answer):

A. Animal life: Good____ Bad____ Good and Bad____ No Effect____

Reason_____

_____.

B. Plant Life: Good____ Bad____ Good and Bad____ No Effect____

Reason_____

_____.

IV. Now that Sandburg is being used by the public, the environment may or may not have an effect on Freeport. How may the following have been affected (give reason):

A. Paved Roads: Good____ Bad____ Good and Bad____ No Effect____
Reason:_____

_____.

B. Neighborhood: Good____ Bad____ Good and Bad____ No Effect____
Reason_____

_____.

C. Other Schools: Good____ Bad____ Good & Bad____ No Effect____
Reason_____

_____.

D. Other Businnesses: Good____ Bad____ Good & Bad____ No Effect____
Reason_____

_____.

V. Write a short answer to each question below?

A. What is good about the Sandburg environment? Why?

_____

_____

_____

B. What is bad about Sandburg's environment? Why?

_____

_____

_____

FREE FILMS AND FILMSTRIPS FOR SEE

District		Dates	Alternate
F407	Conserving Our Soil & Water	9/6-13/76	9/20-27/76
333.72	Conservation of Natural Resources	9/13-20/76	10/4-11/76
F720	Conserving Soil & Water	9/13-20/76	10/4-11/76
574F	Food Cycle & Food Chains	9/13-20/76	10/4-11/76
631.4C	What Is Soil	10/4-11/76	10/11-15/76
F1112*	Water Conservation Today	10/11-18/76	11/1-8/76
F1113*	Soil Conservation Today	10/25-11/1/76	11/8-15/76
F1112-1*	Wildlife Conservation Today	11/11-18/76	10/18-25/76
333.72E	Conserving Our Wildlife Today	11/15-22/76	11/29-12/6/76
F1113-1*	Forest Conservation Today	11/15-22/76	11/29-12/6/76
F1114*	Land Conservation Today	12/6-13/76	12/13-20/76
333.72C	Conserving Our Mineral Resources	12/6-13/76	12/13-20/76
F1115*	Mineral Conservation Today	12/13-20/76	1/10-17/77
301.3	Population Ecology	1/3-10/77	1/17-24/77
F1115-1*	Urban Conservation Today	1/17-24/77	2/7-14/77
F1524*	Our Soil	2/7-14/77	2/28-3/7/77
502	Nature's Half Acre	2/14-21/77	3/7-14/77
F1524-1*	Some Problems We Face	3/7-14/77	3/14-21/77
F1525*	Our Grasslands	4/4-11/77	4/11-18/77
620.1	Noise Is Pollution, Too	4/4-11/77	4/18-25/77
F1525-1*	Our Mineral & Energy	4/18-25/77	5/2-9/77
F1526*	Our Forests	5/2-9/77	5/9-16/77
F1526-1*	Our Water & Air	5/16-23/77	5/2-9/77
SHELL FILM LIBRARY			
	Air Is For Breathing	9/6-10/76	9/20-24/76
	Food or Famine	10/4-8/76	10/25-29/76
	The Living Soil	11/8-12/76	11/22-26/76
	Oil	12/6-10/76	12/20-24/76
	Pesticides in Focus	1/10-14/77	1/24-28/77
	The Rival World	2/7-11/77	2/21-25/77
	The River Must Live	3/7-11/77	3/21-25/77
	Under Sea Oasis	4/4-8/77	4/18-22/77
BUREAU OF MINES			
274	Wealth Out of Waste	9/13-17/76	10/11-15/76
268	Tennessee & Its Natural Resources	10/18-22/76	11/15-19/76
254	Alaska & Its Natural Resources	11/22-25/76	12/6-10/76
248	Idaho & Its Natural Resources	1/10-14/77	2/7-11/77
242	Oregon & Its Natural Resources	2/21-25/77	3/21-25/77
233	Nevada & Its Natural Resources	4/4-8/77	1/17-21/77
226	California & Its Natural Resources	5/2-6/77	5/16-20/77
178	Arizona & Its Natural Resources	5/9-13/77	5/23-27/77

Free Films and Filmstrips For See (Cont.)

EASTMAN KODAK COMPANY

0246	All The Difference	9/6-10/76	9/20-24/76
0342	Yellowstone National Park	10/6-10/76	10/20-24/76
0341	Olympic National Park	11/8-12/76	12/13-17/76
0226	Trek to The Tetons	11/15-19/76	12/20-23/76

ALUMINUM ASSOCIATION

	Recycling: A Study in Ecology	9/6-10/76	10/4-8/76

NORTHERN ILLINOIS GAS COMPANY

The Steel Reefs	9/6-10/76	10/4-8/76
Hearing & Noise	10/11-15/76	11/15-19/76
Living With Energy	12/13-17/76	1/24-28/77
Color Is Living	2/21-25/77	3/14-18/77

MATERIALS AVAILABLE FOR SEE PROGRAM

3 Invicta Trundle Wheels
2 Invicta Land Chains
2 Invicta Clinometers
3 Steel Tapes
24 Clipboards
4 Fresnel Lenses
1 Ecology Reading Lab

AUDIO VISUALS FOR SEE PROGRAM

1 set Ecology transparents
1 set Water Transparents
1 set Water on Earth Transparents

FILMSTRIPS WITH CASSETTES

Wide Open Space and Human Gardine Cans
Pollution Unemployment and Inflation
Suicidal Society
Poison, Pills, Pressure and Preservatives
Public Good and Eminent Domain
There Ought to Be A Law
Air Pollution
Land Pollution
Water Pollution
Fighting Pollution
You Live in A Space Ship
Everything You Used Energy
From Problem to Problem
Some Real Solutions
When Grass was Green and Water Blue
III Fares The Land

Filmstrips with Cassettes (Cont.)

What is Conservation
Utilizing Our Resources
Adding to Our Resources
Our Human Resources
Life in The Soil
Terrestrial Ecology
Life in A Stream
Life in A Pond--Myriad Forms

BOOKS AVAILABLE FOR SEE PROGRAM

Sandburg Library

745 B "Country Treasures" Louis Beetschen, Pinwheel Books
Leaf Pictures, insects, animals, birds
Mobiles - leaves, flowers, etc.
Creepy Crawlies
Corn husk dolls
Pine and Fir cones - Sculpture

751.4 "More to Collect and Paint from Nature" John Hawkinson
Painting shapes, birds, butterflies from nature

F HOB "Look Again" Tana Hoban

808.81C "The Birds & Beast Were There" Woodcuts by Helen Siegl

746.1R "Weaving Without A Loom" Sarita R. Rainey

Art Office -(Art Supervisor's Office)

#627 "Learning about Nature through Crafts" Virginia W. Murrelmen

#629 "Book of Indian Life Crafts" Oscar E. Norbeck

#376 "100 Art Projects" Norman Laliberte & Richard Kehl

#707 "Discovering Design" Marion Downer

#628 "Creative Nature Crafts" R. O. Bale

#634 "Using Natural Materials" Seonaid Robertson

District 145 Film

701.8 Discovering Creative Pattern - Color film
701-A Discovering Ideas for Art - Color film

Emphasis Art

F-1410 Part I
F-1410-1 Part II
761 How to Make Potato Prints
741-A Birds & Etching

ILLINOIS STATE LIBRARY
Centennial Building
Springfield, Illinois 62706

Mrs. Garnetta Cook
Audio Visual Section

P. 2 Art and Environment
80 Slides, Tape-Narrative, Magazine, 9 Posters

P. 5 Expressive Forms in Nature
100 Slides - Organic forms

P. 9 The Evolving Creative Vision
40 - 2x2 slides - Visual Elements of the Enviornment

P. 3 Children Paint Their World
30 slides - 7th Grade Students

P. 7 Posters by Modern Masters
17 slides

P.11 Discovering Texture
Film

P.13 Exploring Art Techniques
4 film strips and records on Mosaic, Weaving, Applique, and Printmaking